

Δ-4-Desaturases from Euglena gracilis, expressing plants and PUFA comprising oils**Abstract**

The present invention relates to an improved process for the specific preparation of unsaturated ω -3 fatty acids, and to a process for preparing triglycerides having an increased content of unsaturated fatty acids, particularly of ω -3 fatty acids having more than three double bonds. The invention relates to the preparation of a transgenic organism, preferably a transgenic plant or a transgenic microorganism, having increased content of fatty acids, oils or lipids having Δ -4 double bonds owing to the expression of a Δ -4-desaturase from *Euglena gracilis*.

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10 The invention additionally relates to expression cassettes comprising a nucleic acid sequence, a vector and organisms comprising at least one nucleic acid sequence or one expression cassette. The invention additionally relates to unsaturated fatty acids and to triglycerides having an increased content of unsaturated fatty acids and to the use thereof.

15 Fatty acids and triglycerides have a large number of uses in the food industry, in animal nutrition, cosmetics and in the drugs sector. They are suitable for a wide variety of uses depending on whether they are free saturated or unsaturated fatty acids or triglycerides having an increased content of saturated or unsaturated fatty acids.